

DOCUMENT RESUME

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[Adequacy of Controls Placed on Radioactive Material Containers]. EMD-77-35; B-164105. May 11, 1977. 6 pp. + enclosure (2 pp.).

Report to Rep. Christopher J. Dodd; by Elmer B. Staats, Comptroller General.

Issue Area: Energy (1600); Energy: Making Nuclear Fission a Substantial Energy Source (1606).

Contact: Energy and Minerals Div.

Budget Function: Natural Resources, Environment, and Energy: Energy (305).

Organization Concerned: Nuclear Regulatory Commission.

Congressional Relevance: Rep. Christopher J. Dodd.

Authority: Energy Reorganization Act of 1974. Legislative Reorganization Act of 1970.

Recommendations presented in a 1973 GAO report on nuclear regulatory activities have yet to be fully responded to by either the Atomic Commission (AEC) or its successor, the Nuclear Regulatory Commission (NRC). GAO recommended that the agency should: develop quality assurance requirements for licensees to follow in fabricating containers used to transport the more hazardous radioactive materials; review the designs of older-spent fuel containers to insure that they met current standards or that their use was appropriately restricted; and insure that licensees' transportation activities are appraised regularly. Findings/Conclusions: AEC prepared rule changes in accordance with the recommendations on regulation of container quality and wear, but neither AEC nor NRC adopted them. Fruitless attempts to require licensees to describe in their applications the establishment and maintenance of quality assurance programs for designing, fabricating, assembling, and testing transportation containers were made, and recently NRC has been trying to develop a graded approach not being regularly appraised. The time for refining and revising regulations is over, and the time is right for implementing the regulations. NRC requires licensed applicants to demonstrate the safety of their containers by various tests, such as impact, puncture, heat, and immersion in water, but officials do not consider it necessary to test by crushing. Recommendations: Regulations insuring container quality and inspection of old containers should be completed and forwarded for review. Container manufacturer inspections should be included in the radioactive materials inspection program. NRC's present procedures and management controls for developing and implementing new licensing and inspection requirements should be reexamined to insure that such requirements are promulgated timely. Crushing should be used as a test for container safety. (Author/SS)



MAY 11 1977

B-164105

The Honorable Christopher J. Dodd
House of Representatives

Dear Mr. Dodd:

In response to your request of July 21, 1976, and additional discussions with your Office, we have followed up on those recommendations in our July 31, 1973, report "Opportunity for AEC to Improve its Procedures for Making Sure that Containers Used for Transporting Radioactive Materials are Safe" (B-164105) and related matters of interest to you.

Under the Energy Reorganization Act of 1974, effective January 19, 1975, the nuclear regulatory activities discussed in our 1973 report were transferred from the Atomic Energy Commission to the Nuclear Regulatory Commission. To date, these agencies have not been fully responsive to the recommendations of our prior report.

RECOMMENDATIONS OR PROMISED ACTIONS
STILL NOT IMPLEMENTED

In our 1973 report, we recommended that the Chairman, Atomic Energy Commission

- develop quality assurance requirements for licensees to follow in fabricating containers used to transport the more hazardous 1/ radioactive materials,
- review the designs of older spent fuel containers to insure that they met current standards or that their use was appropriately restricted, and
- insure that licensees' transportation activities are appraised regularly.

1/The more hazardous radioactive materials include those types used to sustain a nuclear reaction (fissile materials) and any other radioactive materials whose aggregate radioactivity exceed specified levels.

The Commission agreed and told us that appropriate amendments to its transportation regulations were being prepared.

On August 29, 1973, the Atomic Energy Commission advised the House and Senate Committees on Government Operations, as required by the Legislative Reorganization Act of 1970, of the actions it was taking on our recommendations. It stated that rule changes were being prepared to (1) require licensees to establish quality assurance programs for the design, fabrication, and use of containers and (2) revoke existing licenses for certain spent fuel containers so that licensees would have to submit applications for use of these containers in accordance with current standards. The Atomic Energy Commission published the proposed regulations for public comment in December 1973 but did not adopt them, nor had the Nuclear Regulatory Commission as of February 1977.

No container quality assurance regulations adopted

The quality assurance related provisions in the transportation regulations were general requirements that licensees maintain operating and inspection procedures adequate to assure compliance with the regulations. As early as November 1970, the Atomic Energy Commission considered amending these regulations to require licensees to establish, maintain, and describe in their applications quality assurance programs for designing, fabricating, assembling, and testing transportation containers. Nevertheless, no actions were taken until after our 1973 report was issued, and then the Atomic Energy Commission published proposed regulations for public comment. ^{1/} The proposed regulations included quality assurance requirements and specific tests for containers.

Most comments received were from container fabricators who objected to the proposed testing requirements. These fabricators contended that certain tests would disrupt their existing fabrication processes, and certain others would not be appropriate for many container types. Four of the ten firms commenting on the proposed regulations did endorse the

^{1/}Since 1972 the Commissions have required licensees to provide quality assurance programs for spent fuel and plutonium containers only.

need for improved container quality assurance criteria. The Atomic Energy Commission began reevaluating the proposed regulations and planned to adopt rewritten regulations in May 1975.

In 1975, however, the Director, Office of Nuclear Material Safety and Safeguards, Nuclear Regulatory Commission, questioned the value of the proposed regulations because the effort that would be required of his licensing staff to implement them was not justified. The Director's position is that the quality assurance requirements should not be applied to all types of containers to the same degree. Since August 1975, his Office and the Office of Standards Development have been trying to develop a graded approach for quality assurance requirements consistent with the potential hazards of the authorized contents.

"Grandfathered" containers
may still be used

In our 1973 report we pointed out that certain spent fuel containers fabricated before 1966 and approved under previous standards, but still in use, had not been evaluated under the current, more stringent standards. The Atomic Energy Commission agreed with our recommendation to identify and review the design of these so-called grandfathered containers. However, proposed actions to satisfy our recommendation were made part of the proposed regulations for improved quality assurance, which have not been adopted.

There are two grandfathered types of containers which seven licensees are presently authorized to use. Two containers of one design are used by a licensee for in-plant transfer of fuel. Six licensees are authorized to use one container of the other design for shipping test reactor fuel. According to the Nuclear Regulatory Commission, the container has been improved, but its improved design has not been reevaluated under current performance standards.

Licensees' container fabrication
activities not appraised

In our 1973 report, we recommended that the Chairman, Atomic Energy Commission, insure that licensees' transportation activities are regularly appraised. Officials stated at that time, that they would develop guidelines for appraisals and would require regional inspection offices to appraise licensees'

container fabrication activities. However, the Nuclear Regulatory Commission has appraised only two fabricators of spent fuel containers and is considering including manufacturers of other types of containers as part of its inspection programs.

Conclusions

We question the effectiveness of the Nuclear Regulatory Commission's actions for developing and implementing licensing and inspection requirements in time to be consistent with its public health and safety responsibilities. We recognize the need, and the time necessary, for considering different points of view. However, in the public interest, decisions on effective regulation must be timely. At some point, decisionmakers must strike a balance between the benefits to be gained from further refining proposed regulatory actions and the potential risks resulting from their delay.

In this case, we believe that the recommendations we made in 1973 are still warranted. We see no reason why the regulations for quality assurance programs and review of grandfathered containers should not be adopted, nor why the Nuclear Regulatory Commission should not appraise licensees' container fabrication activities. We found other examples of delay in developing regulations. For example, proposed regulations for better security at nuclear powerplants had been under consideration from November 1974 until their adoption in March 1977--about 28 months. In another case, the Atomic Energy Commission announced in 1970 that it would issue reprocessing plant decommissioning criteria; yet, the criteria have not yet been developed, nor does the Nuclear Regulatory Commission have a target date for this effort.

Recommendations

We recommend that the Chairman, Nuclear Regulatory Commission, direct the staff to complete and forward for review, on a priority basis, the proposed container quality assurance regulations and the regulation revoking the existing grandfather clause.

We also recommend that the Chairman include container manufacturer inspections in the Commission's radioactive materials inspection program.

Finally, we recommend that the Chairman reexamine the Commission's present procedures and management controls for developing and implementing new licensing and inspection requirements to insure that such requirements are promulgated timely.

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In commenting on our letter (see enc. I), the Commission stated that since 1972 it has required quality assurance programs for spent fuel and plutonium containers. We must point out, however, that these types of containers totaled only 40 out of 162--about 25 percent--of the approved container designs. Quality assurance requirements had not been applied to the remaining 122 approved designs.

NEW CONTAINER PERFORMANCE
STANDARDS MAY BE NEEDED

The Nuclear Regulatory Commission requires license applicants to demonstrate--by analysis, comparison to similar containers, or actual testing,--that their containers will keep radioactive material releases below specified levels under certain normal and accident conditions. The accident conditions include (1) a 30-foot free drop (to measure impact resistance capability), (2) puncture, (3) heat, and (4) immersion in water.

Research sponsored by the Energy Research and Development Administration in 1976 revealed that crush--rather than impact--is the dominant force in accidents involving multiple quantities of containers transported by trucks. For the most hazardous radioactive materials, trucking is the most commonly used transportation mode. As a result of this research, the Energy Administration is now developing--for its own use and possible recommendation for incorporation into the Nuclear Regulatory Commission regulations--a performance standard for container crushing under accident conditions. The Energy Administration expects to complete this work about June 1977 and intends to adopt the standard in its transportation requirements.

The Nuclear Regulatory Commission is not participating in the development of this performance standard. While it recognizes that the major accident force--crushing--is not addressed in its performance standards, it also believes that, based on transportation experience, the standards have been

satisfactory. For example, containers meeting the impact test have substantial resistance to crushing. Officials told us that as part of an ongoing transportation-related rulemaking proceeding, the Commission is reexamining the adequacy and appropriateness of all of the present performance standards for containers used to ship the more hazardous radioactive materials, including whether or not a specific standard on crush is needed.

Conclusion

We believe it important that container performance standards reflect actual transportation conditions, including accident conditions. The Energy Research and Development Administration has found that crushing is the dominant force in accidents involving multiple quantities of containers transported by truck and is developing a crush standard for its own use and possible adoption by the Nuclear Regulatory Commission. For this reason, we believe that container performance standards should address crushing since it is the predominant accident condition for containers shipped in multiple quantities.

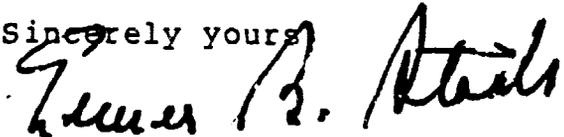
Recommendation

We recommend that the Chairman, Nuclear Regulatory Commission, include crushing as one of the container performance standards.

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As directed by your office, we are sending copies of this report to the Chairman of the Nuclear Regulatory Commission and selected Committees and Members of the Congress.

Sincerely yours,



Comptroller General
of the United States

Enclosure



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 19 1977

Mr. Monte Canfield, Jr.
Director, Energy and Minerals Division
U.S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Canfield:

Subject: GAO Draft Letter Report to the Honorable Christopher J. Dodd, Connecticut, on the Nuclear Regulatory Commission's Procedure to Assure Safety on the Transportation of Radioactive Materials

This will confirm that the subject draft report has been reviewed by senior staff members of the NRC. Except for the discussion of quality assurance and the recommendation to add a crush test, we believe that the report is factually correct and fairly presents the view of the NRC.

The report states that the NRC has not adopted container quality assurance regulations. Although specific quality assurance requirements have not as yet been included in the NRC regulations, the NRC has not neglected quality assurance practices for packages. There are general quality assurance requirements in the regulations (e.g., maintenance, operating, and inspection procedures; and procedures for closing and opening containers), and we have required rigorous quality assurance plans for construction of packages used to transport spent reactor fuel and plutonium since 1972. These plans follow the 18 quality assurance requirements that are applied to nuclear reactors and other facilities (Appendix B, 10 CFR 50). The adequacy of these plans are reviewed and approved by specialists on the NRC staff before package approvals are issued. While this practice may not conform to the letter of the previous GAO recommendation, we believe that it follows its spirit. The absence of more specific quality assurance provisions in the regulations had not endangered the health and safety of the public.

You also recommend that the NRC include a crush test as one of the container performance standards. Our current regulations require that all packages be designed to survive impact, puncture and external pressure tests. It is our belief that a package that meets these performance standards has substantial resistance to crush. The NRC has

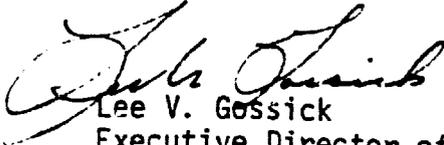
Mr. Monte Canfield, Jr.

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issued a report that evaluated the environmental impact of transportation of radioactive material (NUREG-0034). This evaluation, which was based in part on the ERDA study to which you referred in your report, showed that the risk to the public was very small, even when containers were subjected to severe crush environments. Nevertheless, the NRC is in the process of identifying and evaluating alternatives to the present regulations to assure that the risk to the public is as low as reasonably achievable. The possible addition of a crush test is one of the alternatives that will be considered. In view of this evaluation, we believe it is inappropriate to adopt the GAO recommendation at this time.

Regarding the GAO comment about the delay in developing decommissioning criteria for reprocessing plants, there does not appear to be a need for such criteria at this time in view of the President's policy statement on reprocessing. With respect to the existing commercial plant (NFS), decommission should be handled on an individual basis.

Sincerely,



Lee V. Gossick

Executive Director of Operations